

CAPACITY BUILDING

Promoting research for the fragile Somali health system – Main findings from a successful conference

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A 3-day conference was held in Garowe from the 30th of January to the 1st of February 2022 under the leadership of the Somali National Institute of Health to strengthen the foundation of health research in the country by promoting strategies for health research capacity building, sharing available evidence for action, and widening research collaborative networks. The conference was also instrumental in concretizing plans for improving the existing Somali Universities' health research performance. It was jointly organized and supported by the National Institute of Health, the Federal Ministry of Health and Human Services, the Public Health Agency of Sweden, the Somali Swedish Researchers' Association, and a consortium of Somali and Swedish universities. The Puntland State Ministry of Health hosted the conference. This paper summarizes topics presented at the conference and identifies gaps and opportunities for research capacity strengthening in Somalia, which would generate evidence to inform public health policies.

An Organizing Committee for the management and logistics of the conference and a Scientific Committee were established, the latter providing expertise in selecting key research topics and speakers/delegates for the conference. More than 180 participants from academic institutions and the health sector service delivery network attended the conference. Twelve panel presentations and 51 abstracts were delivered, covering health system research priorities. Of the 51 presented abstracts, 35% were on communicable diseases, 26% on reproductive maternal, newborn, child, and adolescent health, 24% were on the health system, and 16% on non-communicable diseases. The conference also highlighted the need to build research capacity to support researchers and institutions to strengthen their research skills, including research methodology, data analysis, interpretation, and scientific writing. Highly relevant findings were presented that had the potential to inform health policy and scale up the community-based health services towards Universal Health Coverage and Sustainable Development Goals.

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Introduction

The First Health Research conference in the post-conflict recovery phase conducted under the leadership of Somalia's National Institute of Health (NIH) was a historic event where Somali universities and health system professionals presented their research [1]. The 3-day conference was in response to the demand for action-oriented research, aimed to improve access to equitable, essential, and quality health services [2]. The event coincided with the launching of the government's

health sector strategic vision, mission, and implementation plan founded on the Primary Health Care (PHC) approach through the development of an Essential Package of Health Services (EPHS) leading towards a better health and well-being for all and accelerating progress on achieving the 2030 Agenda of Sustainable Development Goals (SDGs) [3].

The main aim of the conference was to strengthen the foundations of health research by promoting

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capacity-building strategies, sharing available evidence for action, widening networks for research collaboration, and planning to improve the performance of the fragile national health system and establish effective research partnerships with existing Somali universities. A full conference report is available from NIH [4]. This paper summarizes topics presented at the conference and identifies gaps and opportunities for research capacity strengthening in Somalia that would serve to generate evidence to inform public health policy.

Planning of the conference

The NIH and the Federal Ministry of Health and Human Services (FMOH) of Somalia supported by the Public Health Agency of Sweden (PHAS), the World Health Organization (WHO) Country Office, and the joint initiative of Somali-Swedish Research Cooperation for Health (SSRCH), convened the conference in Garowe, Puntland State, from the 30th of January 2022 till the 1st of February 2022. The conference was hosted by the Puntland Ministry of Health. During the planning phase, a Conference Organizing Committee (COC) and Conference Scientific Committee (CSC) were constituted. The COC consisting of NIH research, management, and communication teams led by the NIH Executive Director formulated the conference operational plans including resource mobilization, arranging conference logistics, coordinating the call for abstracts, and forwarding the submitted abstracts to the CSC. The CSC, consisting of NIH Board members and other experts, was responsible for reviewing and evaluating the submitted abstracts and for the final selection based on established guidelines. The two committees also jointly developed a detailed interactive conference agenda.

Results of the conference

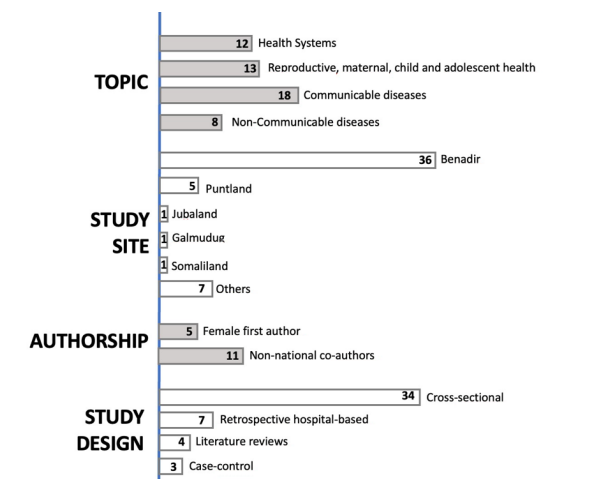


Figure 1. Summary of the 51 abstracts by topic, study site, authorship and study design

A total of 12 plenary and 51 abstract presentations were delivered by public health experts and researchers, respectively, covering various thematic areas (Table 1).

Figure 1 summarizes the abstracts presented by the thematic groups, study site, authorship, and study design. Communicable diseases and reproductive, maternal, newborn, child, and adolescent health dominated the proceedings, accounting for 61% of the abstracts, followed by health system issues and non-communicable diseases. Most (71%) studies were conducted in Mogadishu, the capital of Somalia, while 10% were carried out in Puntland. All abstracts were authored by Somalis as first authors, and only five (10%) of these were females. Most of the studies presented (67%) used a cross-sectional design (Figure 1), followed by retrospective hospital-based studies (14%), literature reviews (8%) and case-control approaches (6%). The following sections summarize the panel and abstract presentations by thematic areas.

Evidence on health system challenges

Four panel presentations were delivered under this thematic area (Table 1). A presentation on research priorities highlighted gaps including the insufficient use of existing knowledge for enhancing health system performance. It also reflected the lack of information on the performance of health systems and how policies affect healthcare. Health research will make the case for change, by improving the capacity to conduct and/or disseminate research to benefit the end users. The panel emphasized research to improve health outcomes for the populations having the greatest need and pursue transparent, participatory, and inclusive implementation processes. Future research will also focus on Universal Health Coverage (UHC), supportive health policy and health systems' performance and management. It will also address the system factors affecting access, and the monitoring and evaluation factors influencing health in relation to equity, access, lifestyle, and health-seeking behaviour.

Human resource challenges

A panel presentation on Somalia's Human Resources for Health presented major challenges that the country is facing. These challenges include the current low density of only 5.4 physicians, nurses and midwives per 10,000 population, while the WHO required threshold, for attaining UHC is 44.5 per 10,000 population. The latter is deteriorated by the inequitable distribution of health professions (physicians, pharmacists, nurses, and midwives) with very low density in the hard-to-reach districts and among the rural and nomadic areas' population [5]. Additionally, there is limited domestic financing available for the required health workforce, where the budgetary gaps are partially bridged by international organizations and donor partners. Yet almost 60% of the country's current health workforce comprises physicians, nurses, and midwives, with a huge paucity of midlevel and community-based health workers required to provide coverage to many health services at the community grassroots level.

Gaps in Integrated Disease Surveillance and Response

A panel presentation on Integrated Disease Surveillance and Response (IDSR) was delivered indicating significant gaps in Somalia's disease surveillance system. WHO calls upon its Member States to adopt the IDSR for implementing comprehensive public health surveillance and response systems for priority diseases at all levels of care [6]. In response to this call and to comprehensively bridge the identified gaps, the NIH and FMOH in collaboration with WHO, the US Center for Disease Control and Prevention, the United Nations Children's Fund (UNICEF), and other partners, adopted IDSR as the prime strategy to improve performance of the national surveillance system, promote the planned roadmap activities, improve the timeliness and completeness of surveillance data and the timely detection of disease outbreaks. The panel stressed the IDSR integration into the EPHS and the national health information system to create a reliable tool for decision-making at every level of the health care system [6].

Impact of Somali Humanitarian Crises

Another panel presented a summary of the complex Somali humanitarian crises in recent years, that caused widespread destruction with millions being displaced from their homes. When the PHC approach was introduced into the humanitarian response in emergency situations, its services enhanced access to lifesaving health interventions. The inclusion of community-based PHC interventions improved disaster awareness, readiness, and mitigation, and became a cornerstone of the emergency response interventions. The PHC focus will require the EPHS approach pursuit, including the scaling up of immunization services, enhancing the capacity of the emergency catchment areas' health facilities and ensuring access to safe drinking water, sanitation facilities and nutrition.

Learnings

The presented abstracts on health systems (Table 1) highlighted several key public health issues and principles. In a study looking into the interactions between SDGs in the Somali context, demonstrated SDG 3 to be heavily influenced by progress on other SDGs in Somalia while making progress on SDG 3 was found to positively influence the progress on most other SDGs. Another major finding, related to challenges faced in the coordination between the national and international health partners at the operational level, is the weak government ownership and commitment to financing the delivery of local health services which may compromise the long-term sustainability of the attained health outcomes. There is a need to build local capacities to enhance the ownership of health workers at the facility level as well as the female community health workers serving in the hard-to-reach communities [7].

A presented study showed that Assistant Community Based Midwifery at the village level played an important lifesaving role in maternal neonatal and child health care by providing antenatal care during pregnancy, assisting

normal deliveries, referring high-risk conditions and complications during the antenatal period, and providing postpartum follow-up services at the rural community level [8]. Two studies on community handwashing and personal hygiene practices, showed poor knowledge of the importance of hand hygiene among mothers, with only about 60% washing hands after defecation or changing baby diapers and before preparing food with the majority using only water without soap [9]. Other findings presented from the health workers' perspective were the limited knowledge about the radiation hazards among radiology health workers and the occurrence of needle sticks and cuts among health workforce, which underlines the need to enhance the safety of healthcare workers and their compliance with disease control and occupational safety measures.

Somali health research

The Somali Health Action Journal (SHAJ), launched in November 2021, was significantly mentioned as an open-access source that offers a platform for national health professionals (researchers, health system managers and policymakers) and international partners to publish local evidence-based solutions for critical health problems facing the Somali health system without any charge. The journal was created through a highly rewarding partnership of the SSRCH acknowledged by the FMOH, Somali universities, the Somali NIH, and the Swedish PHAS.

A panel presentation on a bibliometric study reviewing Somali research publications from 1945 to 2021 raised concerns about the scarcity of research publications on priority Somali public health issues [10]. The papers reviewed also indicated a heavy reliance on the research agenda of external funding organizations and called for developing Somali ownership in terms of leadership, financing and authorship while disseminating the indigenous Somali based health research. The main barriers to publishing included lack of resources, inadequate skills, and lack of clear institutional policies for research capacity building and support to publications.

Evidence on reproductive, maternal, newborn, child and adolescent health

Highly relevant topics on reproductive, maternal, and child health were presented at the conference (Table 1). Studies showed low awareness about induced labour and conditions necessitating this procedure, as well as fear of death or disability as barriers to accepting caesarean section, interfering with the timely provision of lifesaving obstetric interventions and increasing the risk of negative pregnancy outcomes.

A study on fertility and pregnancy outcomes among women with repaired obstetric fistula revealed that one-third of the women conceived before completing the advised two-year period during which they were recommended not to get pregnant. This premature conception significantly increased the risk of abortion, postpartum hemorrhage, and recurrence of the fistula.

A successful financing strategy, supported by the

United Nations Population Fund (UNFPA) introduced emergency obstetric and neonatal care services in a private hospital in Bossaso for providing free services to women had improved access for mothers with limited resources and led to improved maternal and newborn survival. This was a good example of exploiting the private health sector for delivering essential health services in Somalia where healthcare is largely delivered by domestic non-public providers in most urban areas [11].

A study on intrauterine fetal deaths among deliveries in the Benadir Maternal and Children's Hospital showed a high prevalence (42.1/1000). In a study on stunting among 6-59-month-old children, illiteracy of mothers, low antenatal care attendance, non-exclusive breastfeeding, or early introduction of complementary food, and not being vaccinated were identified as risk factors. The same attributes were encountered in children aged 12-23 months with incomplete immunization in another study. These maternal and childhood health issues can be significantly addressed through regular antenatal and postnatal visits.

Another study reported a high prevalence of anemia among children, which was associated with failure to provide exclusive breastfeeding, low maternal education, young maternal age, and sickness of the child in the preceding two weeks. The frequent disease outbreaks illustrated the vital role of disease surveillance and response interventions and the necessity of scaling up routine Expanded Programme on Immunization (EPI) services and their coverage in rural and nomadic hard-to-reach populations.

Evidence on communicable diseases

Of the communicable diseases abstracts presented, 7/18 (39%) were on Tuberculosis (TB) related studies covering the clinical outcomes of TB treatment, drug-resistant tuberculosis (DRTB), adverse drug reactions among patients on DRTB treatment, the risk for TB in human immunodeficiency virus (HIV) infections after antiretroviral therapy (ART) initiation, and magnetic resonance imaging (MRI) findings of intracranial tuberculoma patients. Over 90% of the DRTB cases were pulmonary and the treatment regimen provided consisted of amikacin/ levofloxacin/ cycloserine/ ethionamide/ pyrazinamide, which was associated with good clinical outcomes in the vast majority (80%) of the patients.

In another study, the prevalence of rifampicin resistance in children below 15 years was 11% indicating that this was growing due to risk factors such as contact with the active case(s), previous history of TB treatment, relapses, and erroneous shorter than recommended duration of initial treatment (3-5 months). TB diagnostic delays of up to four months were associated with poor knowledge of disease symptoms and the lack of autonomy in decision-making particularly in female patients.

In a study evaluating the MRI findings of patients with intracranial tuberculoma, more than half were found to be in the supra-tentorial region, while the remaining were in

both the supra-tentorial and infra-tentorial regions. Both multi-focal lesions and single lesions were observed, and abnormalities detected included meningitis, hydrocephalus, and cerebral infarction. Isoniazid preventive therapy provided good protection against TB. Hemoglobin levels below 10 mg/dl posed an increased TB risk in people living with HIV after ART initiation.

A study assessing factors influencing non-adherence to anti-tuberculosis treatment among patients at TB centers during the first wave of COVID-19 in 2020 showed non-adherence in over a third of the patients. Forgetting treatment, side effects, and fear of super-added COVID-19 infection were the reasons for non-adherence. This sharp focus on TB care services dominating the CD sessions is in line with the attention given to this issue during the United Nations High Level Meeting on Tuberculosis in 2018 which is to be followed up in September 2023 to review the actions taken on the previous declaration.

COVID-19 accounted for 17% of the abstracts on CD (Table 1), encompassing issues such as the prevalence of COVID-19 vaccine acceptance and its associated factors that were investigated among individuals aged 60 and above. About 60% were hesitant to take the vaccine due to lack of adequate information, safety concerns, and false perceptions related to religion, which could be resolved through gentle persuasion along with education about the prevention and control of this pandemic. In another study, perceived anxiety, depression, and stress were reported among most healthcare workers in COVID-19 health facilities, which was not surprising as they were the most at risk. In a COVID-19 Knowledge, Attitude and Practices (KAP) study among university students, most of the respondents knew the cause, mode of transmission, and symptoms of the infection. Most of the respondents had worn a mask in public, washed their hands with soap or sanitizers, avoided crowded places, and sneezed into their elbow folds.

The reported outbreak of measles in Benadir region highlighted the need for scaling up routine EPI services and their coverage in urban, rural, and nomadic hard-to-reach populations. From August 3rd to October 17th, 2021, a total of 96 suspected measles cases epidemiologically linked to confirmed cases were reported. Of these, seven (7%) cases were confirmed by laboratory and 87% of the cases occurred in children below five years. Low vaccination coverage resulting from the unavailability of functional cold chain facilities significantly contributed to the outbreak, reflecting the importance of immunization programs for maternal, infant and child health.

A household study showed suboptimal ownership of long-lasting insecticide-treated bed nets (LLINs) and a lack of knowledge of malaria as barriers to their use. This necessitates increasing public knowledge of the benefits of LLINs using all available means of communication. The high risk of hepatitis B as an occupational hazard among health professionals despite the availability of an effective vaccine also came up under discussion. Findings

from two studies indicated good knowledge about hepatitis infection. However, there was a low uptake of the vaccine due to its limited availability and relatively high cost which calls for a strategy for the free provision of hepatitis B vaccine to all high-risk groups.

A high rate of urinary tract infection was detected in pregnant women attending at antenatal clinics, a high proportion of whom presented with symptoms. A study on bacterial contamination among health professionals identified bacterial isolates from their mobile phones, mostly gram-positive and gram-negative bacteria indicating a lack of handwashing. *Pseudomonas* bacteria constituted most of the gram-negative bacteria while *Staphylococcus aureus* and coagulase-negative staphylococci were the most common gram-positive bacteria isolates. Antimicrobial susceptibility profile of *Escherichia coli* in urine samples from diabetic patients showed that above 90% were susceptible to cefpodoxime, colistin, and ofloxacin, and below 88% for imipenem, ciprofloxacin, gentamycin, amikacin, ceftriaxone, and cefepime.

In a study assessing health workers' adherence to infection prevention and control measures for the control of nosocomial infections, most of the respondents stated using antimicrobials, sanitizers, discarding gloves after contact with body fluids, using disposable face masks, and carrying out heat sterilization. The reported measles outbreak illustrated the vital role of disease surveillance and response interventions and the need for scaling up of routine EPI services and their coverage in rural and nomadic hard-to-reach populations.

Evidence on non-communicable diseases

A study on gestational diabetes mellitus in pregnant women coming for antenatal care visits revealed a prevalence of 16%, with maternal age ≥ 35 years, low physical activity levels, high body mass index, and a family history of diabetes as predictors.

In a study on cardiovascular risk factors and clinical outcomes among patients hospitalized with COVID-19 pneumonia, a mortality rate of 20% was observed and chronic heart disease and diabetes were associated with admission to intensive care units and mortality.

A KAP study on breast cancer, cervical cancer and human papillomavirus (HPV) vaccine among healthcare professionals and medical students showed that the respondents had good knowledge of breast and cervical cancer but only less than half were aware that HPV vaccine, that was readily available, could prevent cervical cancer. However, attitudes towards cancer screening were overwhelmingly positive.

Khat chewing is very common in Somalia with considerable adverse social, health and economic consequences. The prevalence of current chewers of *Khat* among Amoud University students was around 17% and associated with smoking and having a friend or a family member being involved in the same habit.

Non-communicable diseases have shown growing

morbidity and mortality trends in Somalia. Diabetes and hypertension in the elderly were contributing factors for intensive care unit admission and mortality among patients with COVID-19 pneumonia. It is a priority to integrate mental health services into the health system as part of PHC, while strongly discouraging the use of *Khat* and other harmful substances, as mental health conditions and substance use significantly lower the contribution of individuals to society.

Efforts to strengthen research capacities

Special panel presentations on key research capacity building delivered in the workshop included the topics summarized below:

Field Epidemiology and Laboratory Training Program (FELTP)

This is a competency-based, workforce development training program improving epidemiological skills and capacity, focusing on surveillance, practical field investigations, design, analysis, and communication [12]. Courses are given on three levels: a Frontline Program of three months of training, an Intermediate training program of 9–12 months involving more in-depth analysis and data use, and a 2-year Advanced program. Since 2021 and with support from the African Field Epidemiology Network (AFENET), NIH has conducted three frontline courses on simple analysis of survey data on case and outbreak investigations. Health professionals both from the FMOH and states participated in these courses.

Training course on health research methodology and academic writing skills

A planned research training programme led by the Umeå University and the SSRCH offered to Somali academicians and health workers was described. The initiative was to be launched in June 2023, building on a collaboration between Somali and Swedish universities with support from the PHAS, the Somali-Swedish Researchers' Association and the Somali NIH. The training course was to be delivered virtually and through face-to-face interactive education sessions with a focus on understanding and applying quantitative and qualitative methodologies, and on academic research writing skills. Such sessions form the basis for the development of practical study protocols focusing on identified relevant health issues of Somalia to be tested in practice.

Strengthen health research partnerships and collaboration

Research partnerships and networking are critical for Somalia's evolving health institutions such as the NIH, the large number of newly established academic institutions in the country as well as the health services' delivery network. The intended research partnership between local, regional, and international partners is also aimed at strengthening the weak national health research capacity with a focus on the training of academic and health professional groups, facilitating the needed technology transfer, and mobilization of the requisite financial resources. These capacities will enable NIH, the

Somali academic institutions, and the national health services system to generate research evidence needed to solve the local challenges facing the health system and disseminate these solutions across the country. Alignment of researcher and knowledge-user agendas is critical for the uptake of the research findings.

Scientific writing and publishing

Publishing in scientific journals is competitive and often poses a difficult experience for young researchers if not mentored properly by senior professionals and guided into the exciting realm of research where they can utilize their curiosity to work towards the noble cause of enhancing people's health. The title catches the reader's interest and each article needs a conceptual and stylistic frame in accordance with the basic rules when outlining an article. It is also a necessity to think through the entire paper before analyzing the data while ensuring their diligent and honest interpretation.

The non-negotiable manuscript drafting rules include reading and following the guidelines for authors and improving articles as per the peer-review recommendations and the authors' own evaluation of them. Moreover, there are three deadly sins that are unacceptable and penalizable in scientific writing: i) Falsification, as in manipulating data to better fit the 'desired' findings; ii) Fabrication, by literally inventing data to produce the requisite findings and iii) Plagiarism, to steal ideas or results from others without making the necessary acknowledgements/references wherever due.

Public health is a multidisciplinary field, which requires input from several competencies usually necessitating several authors. It is of utmost importance to agree beforehand on those who comply with the authorship criteria set by the scientific community: <http://www.icmje.org>.

Discussion

A platform to connect, share and learn

The Garowe conference was a historic event that provided a platform for 180 Somali health professionals and young researchers to share their research experiences and obtain constructive comments to improve their research work. Participants from academic institutions, national health institutions, and key partners supporting health programmes attended the conference and availed the opportunities for networking and building collaborations and partnerships for future research. The conference also provided an opportunity for health policymakers to obtain an insight into the evidence presented and its policy implications. The studies presented were focused on the country's disease burden, such as reproductive health, maternal and child health, and communicable diseases. Highly relevant findings were presented that have the potential to inform health policy including making accessible hepatitis B vaccinations to at-risk groups; improving sanitation and personal hygiene; improving health workers' knowledge of occupational hazards such

as radiation, needle sticks, and other injuries; and scaling-up community-based health services to deliver maternal and child health services and improve pregnancy outcomes [7].

Somalia is slowly recovering from the aftermath of a protracted civil war and instability that have significantly weakened the scope and coverage of public health services and the potential of health research institutions. Most of the studies presented were conducted by private academic institutions, whereas a lesser number were authored by public health institutions. Public private partnerships can promote collaborative health research undertaking that is not in competition but mutually supportive and coordinated service planning and delivery that improves population health outcomes. The conference provided an opportunity for NIH to engage with these academic institutions and solicit their participation in the conference. Partnerships and collaboration between NIH and Somali academic and research institutions are critical for coordinating and aligning the nation's research agenda. The Field Epidemiology course supported by AFENET and the training course on research methodology and academic writing skills, led by Umeå University and the SSRCH, provide support to these capacity building interventions. This will strengthen the national health research capacity and collaboration between the Somali public and private health institutions and services on the one hand and the establishment of strong partnerships with the international stakeholders and donor partners on the other.

Gaps, needs and challenges

Most of the studies presented at the conference were conducted in Mogadishu, the country's capital, and only a few in Puntland, Jubaland and Galmudug states. This could be related to the fact that most of the academic institutions conducting these studies are in Mogadishu and that the areas outside this city are either insecure or have relatively weaker research capacity, infrastructure, funding, incentives, and partner collaborations to identify the problems and challenges facing the health system.

A majority of the studies presented used cross-sectional or retrospective hospital registry-based design. This underscores the need for interventional and community-based implementation studies. The prevalent noncommunicable diseases, such as liver diseases, chronic respiratory diseases, and cardiovascular diseases were not addressed in the studies presented. The silent killer of hypertension was also missing from the deliberations. This calls for the development of national health research systems, as the first critical step in translating priority health problems and needs into the health research agenda. This will also help researchers and health professionals to focus on studies of health problems and issues relevant to the Somali context.

Of the 93 abstracts submitted, 44% were rejected due to poor study design, questionable methodology, inappropriate or incomplete statistics, or lack of critical interpretation of results. This situation underscores the

need to engage in indigenous collaborative research capacity building in the country's fragile health system, pursuing the path of PHC to firmly embark towards UHC attainment over the next seven years. This will support researchers in strengthening their skills, including research methodology, statistical methods, and data interpretation. There is also a need to improve scientific writing by strictly following the author guidelines of peer-reviewed journals with critical evaluation of manuscripts and adhering to high ethical research standards.

The implementation of evidence-based public health services, the active response to the health workforce crisis, and the building of research capacities are to be pursued through coordinated and harmonized communication. Moreover, concurrent controls of the designed health strategic policies and operational plans committed to health research integration into these planned intervention programs deserve the strongest consideration and focus [13]. Accordingly, the health system will evolve a strong capacity, exemplified by a well-trained and equitably deployed health workforce, and guaranteed gender equity in which the national and international health providers are working in close partnership on health services' planning, and delivery. They will share the commitment of enhancing health financing and reorienting the generated health system evidence towards primary health care and universal health coverage, to ensure that no underprivileged or remotely located communities are left behind in achieving UHC. It is gratifying to note that a high-level meeting of the UN General Assembly is scheduled to deliberate the progress of Member States towards UHC in September 2023 and identify strategies to accelerate the process.

Way forward

The following strategic and operational priority areas for action in capacity building for research were identified through the conference discussions and conclusions:

- Recognize the absence of properly organized and supportive linkages between health research and the implementation of public health interventions. The conference called on the government to promote research capacity building within the health system, to bridge the gap between knowledge and practice, for the effective delivery of PHC services, attainment of UHC, and contributing to populations' health, well-being, and equity;
- Strengthen research governance and leadership capacity in the health academic institutions with a focus on research training, infrastructure, financing and implementation, while establishing Health and Demographic Surveillance System (HDSS) sites that coalesce teaching, research and the delivery of health services both at the facility and community level;
- Allocate realistic budgetary resources for health research at the federal and state governments' level,

acknowledging this support as a key health system priority to serve as an evidence base for decision making, supporting the underprivileged and hard-to-reach population groups, while justifying the levying of health taxes on products that have a negative public health impact such as tobacco and Khat using the generated revenues to finance the essential evidence based PHC services to advance population Health;

- Regard the recent launching of the Somali Health Action Journal (SHAJ) as a major milestone conceding the powerful role that an open access and peer reviewed journal can play in bringing together researchers and key stakeholders to work towards addressing the crucial health issues facing the country.
- Build multidisciplinary and intersectoral partnerships with all the stakeholder groups as catalysts for health action, while pursuing integration for the sustainability of the PHC priority interventions and UHC gains.
- Respond to the limited available research evidence by enhancing in-country collaborative strategies on the health challenges encountered supported by regional and international research collaborative approach as the way forward.

The conference emphasized the need to promote context specific health research for policy and action, as a central pillar for the recovery and resilience building of the highly fragile health system with strengthened research capacity at the operational level, at the academic institutions and at the national and international collaborative level. To sustain the research capacity development, the necessary resources that include the required training, the budget, the infrastructure, and the necessary research time are the required mechanisms to accelerate progress towards achieving UHC and SDGs.

Summary in Somali

CINWAAN

Natiijooyinka ugu muhiimsan ee shir cilmi-baaris heer-qaran ah, ee guul xambaarsan oo diiradda saaraya baahida cilmi-baarista soomaaliya

SOOKOOBID

Waxaa magaalada Garoowe ka dhacay 30-ka Janaayo ilaa 1-da Febraayo 2022 shir socday muddo 3 maalmood ah oo uu hoggaaminayay Machadka Caafimaadka Qaranka Soomaaliyeed, ujeeddadiisuna ahayd sidii loo xoojin lahaa aas-aaska cilmi baarista caafimaadka dalka, iyadoo la kobcinayo xeeladaha aawood-dhisidda cilmi-baarista caafimaadka, wadaagidda caddaymaha la hayo si loogu hawlgalo, iyo ballaarinta shabakadaha iskaashiga cilmi-baarista. Shirku waxa uu sidoo kale qayb ka ahaa caddeynta qorshayaasha lagu horumarinayo waxqabadka cilmi baarista caafimaadka ee ka jira Jaamacadaha dalka. Waxaa si wada jir ah u soo qabanqaabiyay oo gacan ka geestay Machadka Qaranka ee Caafimaadka, Wasaaradda Caafimaadka iyo Adeegga Bulshada

ee Dowladda Federaalka, Hay'adda Caafimaadka Dadweynaha ee Sweden, Hayadda Caafimaadka Adduunka, Ururka Cilmi-baarayaasha Soomaaliyeed, iyo xiriirka ka dhexeeya Jaamacadaha Soomaaliya iyo Sweden. Shirkan ayaa waxaa martigelisey Wasaaradda Caafimaadka Dowladda Puntland. Qoraalkani waxa uu soo koobayaa mawduucyada lagu soo bandhigay shirka oo tilmaamaya daldaloolada iyo fursadaha lagu xoojinayo awoodda cilmi-baarista Soomaaliya, taas oo keeni doonta xogo iyo caddaymo lagu wargelinayo siyaasadaha caafimaadka bulshada. Waxaa la dhisay guddiga qabanqaabada maamulka iyo saadka shirka iyo guddi cilmiyeed, oo kan dambe uu adeegsanayo khibrad xagga xulashada mawduucyada cilmi-baarista ee muhiimka ah iyo af-hayeennada/ergooyinka shirka. In ka badan 180 ka-qeybgale oo ka kala socday jaamicadaha iyo qaybaha caafimaadka dalka ee bixiya adeegyada ayaa ka soo qeyb galay shirka. Isugeyn 12 soo-jeedin bandhig iyo 51 qoraal ayaa la keenay, kuwaas oo daboolaya cilmi-baarista mudnaanta u leh nidaamka caafimaadka. Konton iyo kowda qoraal ee la soo bandhigay, 35% waxay ku saabsanyihiin cudurrada faafa, 26% caafimaadka hooyada, dhallaanka, carrurta iyo dhallinta; 24% waxay la-xiriiraan nidaamka caafimaadka iyo 16% oo ku wajahan ka hortagga iyo xakamaynta cudurrada aan la kala qaadin. Shirku wuxuu sidoo kale iftiimiyay baahida loo qabo in loo hawl galo dhisidda awoodda cilmi-baarista si loo taageero cilmi-baarayaasha iyo hay'adaha si ay u xoojiyaan xirfadahooda cilmi-baarista, oo ay ku jiraan habka cilmi-baarista, falanqaynta xogta iyo fasiraaddeeda oo ay weheliso diyaarinta qoraalada cilmiga ah. Natijooyin ahamiyad weyn leh ayaa la soo bandhigay, kuwaas oo awood u leh in ay wargeliyaan siyaasadda caafimaadka, korna u qaadaan ka qaybgalka bulshada xagga fulinta adeegyada caafimaadka ee ku wajahan higsiga Caafimaadka Baahsan iyo Yoolalka Horumarinta Waara.

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Competing interests

The authors declare no competing interests, both financial and non-financial.

Ethical standards

The information contained in this paper is based on the publicly available conference proceedings. The authors of the abstracts on human subjects obtained ethical approval from their respective institutions. In addition, informed consent was obtained from study participants or parents or guardians in the case of children.

Author contributions

All authors led the conference planning and organization, MB coordinated the communication with universities and the conference venue organizing ministry, AD, MW and BK were part of the scientific abstracts screening committee, MW and BK drafted the manuscript, AD, MW, MB, and BK have read, contributed to, and approved the final manuscript.

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Table 1: Research areas and topics covered during the conference

Research area	Topics	Type	Presenter (s)	Affiliation (s)
Health systems	Health system research priorities	1. Panel	Mohamed Abdi Jama	Ministry of Health
	Human resources for health	2. Panel	Mohamed Hussein Alasow	Ministry of Health
	Integrated disease surveillance and response	3. Panel	Abdifatah Diriye Ahmed	Ministry of Health
	Humanitarian emergencies in the framework of primary health care practices	4. Panel	Khalif Bile	SSRA
	Promoting partnerships and local ownership	5. Abstract	Jamal A. Mohammed	University of Warwick
	Linkages between Sustainable Development Goals in Somalia	6. Abstract	Hassan Warsame Nor	Benadir University
	Evaluation of Universal Health Coverage of Maternal Health Policies	7. Abstract	Jamila Aden	East Africa University, Bosaso
	Post-Conflict Health Care System in Somalia from 2000 to 2020	8. Abstract	Adam Sheikh Said	University, Moscow, Russia
	Role of Assistant Community Based Midwifery in Maternal Health Care System	9. Abstract	Abdikani Said Farah	Aragan Health Organisation
	Factors affecting practice of hand hygiene among adult women	10. Abstract	Abdiaziz Aden Hashi	Benadir University, Somalia
	Knowledge, attitude and practice of hand washing among mothers	11. Abstract	Hafsa Mohamud Mohamed	Benadir University,
	Medical doctors' awareness of radiation exposure in diagnostic radiology	12. Abstract	Ahmed Adam Osman	Somali-Turkish Training and Research Hospital
	Needles stick and sharps injuries and its associated factors among health care workers	13. Abstract	Nor Haji Osman Abdi	Benadir Hospital
	Motivation of maternal health workers in conflict setting of Mogadishu, Somalia	14. Abstract	Naima Said Sheikh	Norwegian Institute of Public Health
Launching the Somali Health Action Journal & related research topics	Launching the Somali Health Action Journal (SHAJ)	15. Panel	Khalif Bile, Klas-Göran Sahlén	SSRA and Umeå university
	Somali health research – past, present and future perspectives	16. Panel	Stig Wall	Umeå university
	Scarcity of Peer-reviewed articles among Somali public health lecturers	17. Abstract	Abdiwahab Mohamed Hassan	Somali Institute for Development Research
	Development of National Ethical Guidelines for Health Research	18. Panel	Maye Omar	University of Leeds, UK
Reproductive, maternal, newborn, child and adolescent health	Gestational diabetes mellitus among pregnant women	19. Abstract	Ibrahim Abdullahi Mohamed	SIMAD University
	Knowledge, Attitude and Practices regarding Induction Labor	20. Abstract	Sharmarke Hussein Abdi	University of Bosaso
	Knowledge, attitude and willingness to accept Caesarean section	21. Abstract	Abdulahi Ahmed Tahlil	Zamzam University of Science & Technology
	Fertility outcomes after successful obstetric fistula repair	22. Abstract	Abdirisak Hassan	Ministry of Health
	Achievements in improving maternal and neonatal Health care	23. Abstract	Hinda Jama Ahmed	University of Bosaso
	Gender roles and their influence on sexual and reproductive health of youth	24. Abstract	Gallad Dahir Hassan	Somali National University
	Prevalence of intrauterine fetal death among women gave birth	25. Abstract	Sahra Mire	Benadir University
	Factors associated with stunting among children aged 6-59 months	26. Abstract	Mohamed Aden Mohamed	SOS Hospital
	Factors associated with incomplete immunization among children 12-23 month	27. Abstract	Jaffar Abdullahi Omar	Benadir University
	Measles outbreak investigations	28. Abstract	Saidia Hassan Hussein	AFENET, Somalia
	Anaemia among children aged 6 to 59 months	29. Abstract	Ibrahim Abdullahi Guled	Somali National University, Somalia
	Pertussis outbreak investigations	30. Abstract	Mohammed Hassen Ali	Galmudug State
	Breastfeeding practices among Somali mothers	31. Abstract	Mohamed Mohamud	Shobow, Salaam University
	Knowledge, attitude and practices on female genital mutilation	32. Abstract	Fatuma Ismail Mohamed	Benadir Hospital, Somalia
	Barriers to Accessing Healthcare Services for Somali Women in Somalia	33. Abstract	Abdifatah Ahmed Mohamed	Ministry of Health

Research area	Topics	Type	Presenter (s)	Affiliation (s)
Communicable diseases	Long-Lasting Insecticide Nets (LLINS) use among household members	34. Abstract	Abdinur Abdullahi Salad,	Benadir University
	Adverse drug reactions among patients on new MDRTB treatment	35. Abstract	Osman Muhyadin Abdule,	Benadir University
	Clinical Outcomes of Patients with Multi-Drug Resistant Tuberculosis	36. Abstract	Aweis Ahmed Moallim	Mogadishu University
	Rifampicin Resistant Mycobacterium Tuberculosis among MDR Patients	37. Abstract	Mohamed Abdirahman Omar	Benadir University
	Delay of TB patients in diagnosis	38. Abstract	Abdulwahab M. Salad	Somali National University
	Magnetic resonance imaging findings of intracranial Tuberculoma patients	39. Abstract	Ismail Gedi Ibrahim	Turkish Training and Research Hospital
	Tuberculosis among people living with HIV after ART initiation	40. Abstract	Abdulkadir Mohamed Ahmed	Benadir University
	Non-adherence anti-TB drugs during COVID-19	41. Abstract	Abdullahi Abdirahman Omar	SIMAD University
	COVID-19 vaccination acceptance Among Elderly People	42. Abstract	Abdiweli Mohamed Abdi	Modern University Science and Technology
	Stress, anxiety and depression during the pandemic among healthcare workers	43. Abstract	Abdirazak Yusuf Ahmed	De Martino Public Hospital
	Knowledge, attitude and practice towards COVID-19 among medical students	44. Abstract	Walid Abdulkadir Osman	Mogadishu University
	Knowledge on health care workers toward prevention of hepatitis B infection	45. Abstract	Ahmed Sheikh Ali Ahmed	Somali International University
	Uptake of hepatitis B vaccination among healthcare workers	46. Abstract	Abdirizaq Ali Yusuf	Somali National University
	Hepatitis B Vaccination Status and Associated Factors among Health Workers	47. Abstract	Nur Ahmed Hussein	University of Bosaso
	Urinary tract infection among pregnant women	48. Abstract	Yahye Sheikh Abdulle	Jamhuriya University of Science and Technology
	Non-communicable diseases	Bacterial contamination on mobile phone among healthcare professionals	49. Abstract	Adam Sharif Abdulkadir
Antimicrobial susceptibility of Escherichia coli isolates from diabetic patients		50. Abstract	Shafie Abdulkadir Hassan	Jamhuriya University of Science and Technology
Nosocomial infection control among health workers		51. Abstract	Jamal Muhumed Mohamed	Benadir University
Patterns of Limb amputations		52. Abstract	Mohamed Abdullahi Awale	SIMAD
Risk Factors and Clinical Outcomes of Patients with COVID-19 Pneumonia		53. Abstract	Ahmed Mohamud Hussein	Mogadishu University, Somalia
Knowledge, Attitudes, and Practices Concerning Breast and Cervical Cancer		54. Abstract	Mohamed Abdullahi Awale,	Benadir University
Effects of the Coenzyme Q10 on the Peripheral Nerve Injury		55. Abstract	Ahmed Omer Mead,	Salaam University
Research training and capacity	Mental Health Systems Structure and Innovations in the horn of Africa	56. Abstract	Jibril I.M Handuleh	Amoud University
	Khat Chewing among University Students	57. Abstract	Dr Abdifatah Haji Daud	Amoud University
	Malpractice among community pharmacy technicians	58. Abstract	Abdikarim Hussein Mohamed	Turkish training and research hospital
	Field Epidemiology training programme: experience and lesson learnt	59. Panel	Tatek	AFENET, Somalia
	Training of trainers in a blended learning model	60. Panel	Klas- Göran Sahlén	Umeå university
Strengthening health research partnerships and collaboration	61. Panel	Khalif Bile,	NIH BODs,	
Statistical methods and software	62. Panel	Max Betzold	Gothenburg University	
Scientific writing and publishing – some rules and sins	63. Panel	The SHAJ Editorial Team and Editorial Board		